tracted less attention since Angot in 1887, and also Hann, showed conclusively its dependence on secondary local conditions. Three Japanese investigators from the Geophysical Seminary of the Physical Institute, Tokyo, contribute an account [1] of a preliminary attempt to trace more definitely the mechanism of these local influences, one of the most obvious of which, under the name of "continentality," has recently been attracting the attention of Mr. C. E. P. Brooks in this country in connection with climate, and with a purely geographical theory of the ice age.

The elementary definition of continentality as the percentage of land in a circle of definite size (say 10° radius) surrounding the station is clearly insufficient, so much depending upon the orientation and shape of the coast line or lines that the form of the function is bound to be complicated. The Japanese authors soon come to the conclusion that it is not linear, and are constrained to make a series of simplifying assumptions in order to reach a workable hypothesis. The assumptions are no more probable than those of the early days of the theory of tides, with which the present problem has obvious analogies.

With these limitations the authors appear to account for such features as the variation with longitude, the inversion of phase near the poles, and the minimum amplitude near the coast, but a general solution of the problem has evidently not yet been reached. They indicate the lines on which they propose to continue the investigation, and conclude with a representative set of daily variation curves for 10 British observatories, showing considerable dissimilarity, those of Oxford and Aberdeen, for instance, being almost the converse of each other. A systematic series of stations within the Empire, chosen with special reference to the elucidation of this problem, may well form part of the program of coordinated British Empire meteorology so strongly advocated by Maj. Lyons in his presidential address to the Royal Meteorological Society.

The barometric variations dealt with in the above paper, as generally studied, are naturally to be regarded as vertical oscillations of the free atmosphere, though there is a possible difficulty in the differentiation between statical and dynamical pressure, when an ascending or descending current is in question. But there is also a very decided horizontal oscillation or motion of the free atmosphere, and this has begun to attract attention since the use of pilot balloons has provided more information about the direction of the wind at different heights than can be inferred from the motion of clouds. A paper from Batavia [2] has appeared in the Proceedings of the Royal Academy of Amsterdam dealing with the semidiurnal variation of this motion.

There is a good deal of uncertainty about the investigation, even in a favorable place like Batavia, where atmospheric conditions are as a rule very quiet and steady. Observations were made not only at Batavia, but also at a neighboring mountain station of 3,000 meters elevation, as well as from a small coral island, to eliminate the land effect. Single observations are included, specially at times of the day when convection currents are not in evidence in the lower atmosphere; otherwise double observations by day and by night were obtained with different base lines of approximately one-half mile, 1 mile, and 1½ miles in length. Some hundred of ascents were observed, of which a fair proportion reached a height between 9 and 11 kilometers, only 30 per cent failing to reach the 4-kilometer level.

The data are admittedly insufficient to determine a diurnal oscillation, but Dr. van Bemmelen is fairly satisfied with the result for the semidiurnal one. The east and north components are treated separately, and it is found that the former has a greater amplitude than the latter and also a better determined phase. Gold's theoretical results for the lower layers are confirmed (Phil. Mag. vol. 19). The phase of the east component diminishes up to 4 kilometers, and probably increases above that height, showing a fairly close analogy with the vertical oscillations.—*W. W. B.*

[1] *Terada, T., Kiuti, M., & Tukamoto, J.* On diurnal variation of barometric pressure. Jour., Coll. sci., Imp. univ. Tokyo, November 20, 1917, 41, art. 1.

[2] *Van Bemmelen, W., & Boerema, J.* Semidiurnal horizontal oscillation of the free atmosphere up to 10 kilometers above sealevel, deduced from pilot-balloon observations at Batavia. Proc., Roy. acad., Amsterdam, 1917, 20:119-135, plate.

See also the abstract in this REVIEW, January, 1918, 46:22.

SPRING OF 1918 IN THE BRITISH ISLES.

[*Reprinted from* Nature, London, May 9, 1918, 101: 190-191.]

Spring this year has somewhat resembled that of last year, except that the early days of May this year have been much colder. The reports issued by the Meteorological Office show that the cold spells which have prevailed with such persistence in London have been common over the whole of the British Islands. March was, for the most part, dry, mild, and sunny; the mean temperature at Greenwich was 44°, which is 2 degrees above the average, and 5 degrees warmer than March, 1917. The mean temperature for April this year was 45°, which is 3 degrees below the average, but 2 degrees warmer than April last year. The warmest week since the commencement of spring is the week ending March 23, when at Greenwich the mean temperature was 48.2°, which is 5.4 degrees above the average. The week with the greatest deficiency of temperature is the week ending April 20, when the mean was 40.4°, with a deficiency of 6.9 degrees; during this week the rainfall at Greenwich measured 1.79 inches, which is 0.2 inch more than the average for the whole month. In London, at Tulse Hill, in a Stevenson's screen, the maximum thermometer only rose to 60° or above on three days in April, and the highest temperature was 63°; while in March there were seven such warm days, and the highest temperature was 69°. April this year was peculiarly sunless, and this, coupled with the low temperature, kept vegetation throughout the month greatly at a standstill.

DANISH REPORT ON ARCTIC ICE DURING 1917.

[*Abstract reprinted from* Nature, London, May 30, 1918.]

The Danish Meteorological Institute has published its report for 1917 on the state of the ice in the Arctic seas (Isforholdene i de Arktishe Have). War conditions have made it impossible to obtain as full reports as usual except from the coasts of Greenland, Iceland, Spitzbergen, and the Barents Sea. In Spitsbergen and the Barents Sea the ice conditions were again abnormal and most unfavorable. The winter ice in Spitsbergen fjords broke up a month later than usual, and the autumn ice formed several weeks ahead of the average date. There was pack ice off the west coast of Spitsbergen throughout the summer months. The coast was most approachable during the first half of August and the second half of September. Throughout the summer it seems, as usual, to have been easier to enter King's Bay than fjords farther south, but until late in July the pack on the west coast of Spitsbergen more or less met the pack of the Greenland Sea, and on this account it was not easy to reach the open water north of Prince Charles Foreland. Storfjord seems to have been clear of ice in September, and possibly in August. Reports from the Kara Sea are scanty, but the ice conditions there seem to have been bad. No vessel attempted to make the passage in 1917.

RAINFALL IN MYSORE DURING 1916.

[*Abstract reprinted from* Nature, London, May 30, 1918.]

The report on rainfall registration in 1916 in Mysore includes maps showing the actual rainfall for the year 1916, and the average annual rainfall for the period 1870–1915. On June 25, 1916, more than 16 inches of rain fell during 24 hours at Nagar in the Shimoga district; the total rainfall at that place during June was 38 inches, nearly 50 per cent above the normal, although the total fall for 1916 was practically normal at 104 inches. The rains during October and November, 1916, were above the normal on account of an exceptional number of cyclonic storms, which originated in the Bay of Bengal. The rains were on the whole but half of the normal during the cool-weather period, January and February, and also during March, the beginning of the hot-weather period. The deficiency was more than made up during the rest of the year, especially in the northeast monsoon period from October to the end of the year. The tables occupy 58 pages and give the details for the 224 stations under various heads; a notable table is that which gives the distribution in the river valleys.

CLIMATIC NOTES ON PALESTINE, MESOPOTAMIA, AND SINAITIC PENINSULA.

[*Abstract reprinted from* Nature, London, May 30, 1918.]

Weather controls over the fighting in Mesopotamia, in Palestine, and near the Suez Canal is the subject of an article by Prof. Robert DeC. Ward, of Harvard University, in the *Scientific Monthly* (New York, April). Mesopotamia is characterized as "a country of aridity, of intense summer heat, of deserts and steppes, of relatively mild winter, and of cold-season rains." The mean temperature at Bagdad for January is given as 48.7° F., and for August 92.5°; the mean maximum is 119.5°, and the mean minimum 21.9°, which are the mean extremes in the year. Winter frosts occur and snow falls locally. The total mean annual rainfall is only about 8 or 9 inches, and in some years only about half as much. The rain falls between October and May, and the remaining months are practically rainless. February or March is the rainiest month, and the floods come in March and April. The climate of Palestine has been discussed by Exner and Hann, and the article quotes various data. The coast stations have a mean midwinter temperature of between 50° and 55° F., and mean midsummer temperature of 75° to 80°. The hill stations, at elevations of about 1,500 to 3,000 feet, have mean midwinter temperatures from 45° to 50°, and midsummer means from 70° to a little under 80°. In the Jordan Valley the temperatures range from 55° in midwinter to 85° or 90° in midsummer. Jerusalem averages 3.6 days a year with temperature below freezing, and the highest summer temperatures reach 100° to 105°. The annual rainfall at the coast stations ranges from 15 inches to 35 inches, and at Jerusalem it is 26 inches, no rain falling in June, July, and August. The rainy season extends from the middle of October to early in May. In the district of the Suez Canal the complete absence of rain for months together and the exceptionally small total annual fall in places immensely augments the difficulty of transport. Prof. Ward says that winter is the best season for a campaign, both on account of the better water supply and of the lower temperature.

CLOUDS AT THE ROYAL ACADEMY.

By J. S. D[ines].

[*Reprinted from* Nature, London, May 30, 1918, 101:245.]

The smoke and haze which commonly obscure the sky in large cities, and the otherwise restricted outlook, allow the town dweller inadequate opportunities for the study of clouds, but to those who live in the country, and to the observant worker in a town when spending a holiday away from his native place, the ever varying cloud effects form quite as attractive an object of interest as the countryside itself. This being so, it might be thought that in landscape scenes artists would devote at least as much attention to the sky and the clouds above as to the hills and valleys below. That this is not the case will be painfully evident to the meteorologist, or even the ordinary intelligent observer of Nature, who visits the Royal Academy and makes but a cursory examination of its walls. Let it be granted at once that there are notable exceptions, but the conclusion can not be resisted that to many artists the clouds form a very subsidiary part of the picture, and are put in to produce what to the artist's eye is presumably a pleasing effect, but without the least regard to natural truth.

The majority of the clouds appearing in this year's exhibition belong to the strato-cumulus or fracto-cumulus type, though, as would be expected, the hard convection cumulus, the most striking of all clouds, is not neglected. Perhaps the most remarkable feature is the almost entire neglect of high clouds of the cirrus and cirro-cumulus types, which produce some of the most beautiful effects in Nature. Cirro-cumulus is shown in one or two sunset pictures, and a not entirely successful attempt has been made in one case to depict the sun shining feebly through an alto-stratus veil; but true cirrus is almost entirely unrepresented. In "The Passing of Autumn" (91) the meteorologist may think that he detects a fragment of false cirrus showing up against a rather fine cumulus, but the remaining clouds in this picture spoil what might otherwise have been a successful cloud study. True cumulus should surely be a cloud type which would lend itself to the artist's needs without any departure from the forms provided by Nature, but in many cases these clouds are given the most grotesque and unreal shapes, which completely spoil the picture to the observant lover of the country.

On the other hand, some of the most successful clouds in the exhibition appear in B. W. Leader's "The Weald of Surrey" (51) and A. R. Quinton's "The Road over the Downs, Sussex" (695), where clouds of the cumulus and strato-cumulus types are both true to Nature and blend admirably with the peaceful scenes depicted. Less peaceful, but with an equally admirable effect, is A. W. Parsons's "Rolling from the West" (196), where similar